SELP Case Study Summary: Motion Commotion: developing a multi-disciplined learning approach to the understanding of Mathematics in Science

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Purpose:
The purpose of this case study is to use a multi-disciplined learning approach in mathematics and science to improve student’s achievements.

Student cohort /Audience:
Year 10 classes

Activity description:
To produce a unit of work to incorporate the topic of Motion in Science/Physics and Mathematics.
- Science/Physics – 2D motion, Speed/Time/Velocit
- Mathematics – solving linear and quadratic equations algebraically and graphically.

Links to ACARA or other identified learning outcome:
ACARA Year 10 Content Descriptions:
Mathematics: Linear and non-linear relationships
Solve problems involving linear equations, including those derived from formulas (ACMNA235)
Solve problems involving parallel and perpendicular lines (ACMNA238)
Explore the connection between algebraic and graphical representations of relations such as simple quadratics, circles and exponentials using digital technology as appropriate (ACMNA239)
Solve simple quadratic equations using a range of strategies (ACMNA241)
Physical sciences
The motion of objects can be described and predicted using the laws of physics (ACSSU229)

What were the outcomes?
A survey was conducted at the conclusion of the study, and most of the students very positively commented that it is now easier to do algebraic and graphical calculations by knowing the real life applications of mathematical concepts. Additionally, all of the students agreed that the workload was minimized due to the fact that the same topic was being learnt in two subjects from different perspectives. In the end the students were tested and the results were outstanding (survey, results of the tests).

Identified issues?
The original case study was focused on using a multi-disciplined learning approach in Science/Physics, Mathematics, Physical Education, Design and Technology and History. It was unexpectedly complicated to incorporate this topic across all subjects, so I decided to simplify it by just focusing on Science and Mathematics. Also, because this study was planned and conducted during the middle of the year, it was difficult to incorporate it into already established teaching programs.

Refinement or changes for the future:
It would have been better if this teaching plan was discussed with the rest of the Maths and Science faculty at the beginning of the year to have known when to integrate it into student learning for maximum effect. The case study was only conducted on a single Year 10 Maths and Science class, therefore, a better outcome and representation of results could have been achieved by focusing on a larger group of classes.